

F. Vela-Cano (RN)*, D. Ruiz-Sánchez (RN),
J. Granado-Solano (RN), A. García-Sanz (RN),
M. Ortega-Botías (RN), J. Marín-Corral (PhD)

*Servicio de Medicina Intensiva, Hospital del Mar,
Barcelona, Spain*

* Corresponding author.

E-mail address: FVela@parcdesalutmar.cat (F. Vela-Cano).

<https://doi.org/10.1016/j.enfie.2022.01.001>

2529-9840/ © 2021 Sociedad Española de Enfermería Intensiva y
Unidades Coronarias (SEIUC). Published by Elsevier España, S.L.U.
All rights reserved.

Oral hygiene with chlorhexidine and bacterial resistance in intubated patients[☆]



Higiene bucal con clorhexidina y resistencias bacterianas en los pacientes intubados

Several studies affirm that the oral cavity can be the gateway and focus of dissemination of potentially pathogenic micro-organisms. Infections are very prevalent in Intensive Care Units and are an important morbidity and mortality factor. Among the infections related to the respiratory system, ventilator-associated pneumonia (VAP) stands out. This is defined as an episode of pneumonia in an intubated patient requiring invasive mechanical ventilation for at least 48 h, without having been diagnosed prior to intubation.¹

In intubated patients, microbiological changes occur in the flora of the oral cavity, forming a specific biofilm. In addition, there is an increase in risk factors such as those arising from the permanent opening of the oral cavity and the decrease in saliva production secondary to pharmacological sedation. All this contributes to the dryness of the oral mucosa, favouring the formation of bacterial plaque, thus reducing the natural defence system and increasing the risk of VAP.¹

For this reason, evidence-based care packages to reduce VAP, known as “zero pneumonia”, have been implemented in recent years. Among the measures included is oral cavity hygiene using chlorhexidine. Recently, however, studies are emerging that address the possible association of VAP and pneumonia with the use of chlorhexidine. Recently, however, studies are emerging that address the possible association of continued exposure to low doses of chlorhexidine with bacterial resistance mechanisms.^{2,3}

In view of the uncertainty raised, it was decided to conduct a literature review to determine the existing evidence on the use of chlorhexidine in oral cavity hygiene and the relationship with bacterial resistance. Among the few studies found, the literature review published by Cieplik et al.² stands out, which has analysed the acquisition of bacterial resistance mechanisms after sustained exposure to chlorhexidine in different bacterial strains and species. However, the results are variable as chlorhexidine remains

effective as an antiseptic, especially in the prevention of infections. At the same time, data are emerging that warn of bacterial tolerance to chlorhexidine and even cross-resistance with some antibiotics.²⁻⁴

Despite this, there are no specific studies available that address this possible causal relationship, especially in intubated patients in whom oral hygiene is performed using chlorhexidine to prevent VAP. However, some recent studies, such as that of Klarin et al.⁵ propose the use of probiotics as an effective alternative to the use of chlorhexidine in oral cavity hygiene in mechanically ventilated patients.

Therefore, this letter to the editor is presented as a call for attention on a hot and topical research topic, especially for the care of Intensive Care Unit patients. Future lines of research should focus on analysing the widespread use of chlorhexidine in oral cavity hygiene for the prevention of VAP. In addition to analysing whether its continued use leads to bacterial tolerance, as well as quantifying and determining possible bacterial cross-resistance with some antibiotics. This will allow a comparative study of the benefits of its use and the risks it may entail. In order to increase patient safety in the future and individualise patient treatment to ensure nursing care based on the best scientific evidence available.

Financing

This study did not receive any type of financing.

References

1. Da Collina GA, Tempestini-Horliana ACR, Texeira da Silva de DF, Longo PL, Makabe MLF, Pavani C. Oral hygiene in intensive care unit patients with photodynamic therapy: study protocol for randomised controlled trial. *Trials*. 2017;18:385.
2. Cieplik F, Jakobovics NS, Buchalla W, Maisch T, Hellwig E, Al-Ahmad A. Resistance toward chlorhexidine in oral bacteria — is there cause for concern? *Front Microbiol*. 2019;10:587.
3. Kampf G. Adaptive bacterial response to low level chlorhexidine exposure and its implications for hand hygiene. *Microb Cell*. 2019;6:307–20.
4. Schwarz SR, Hirsch S, Hiergeist A, Kirschneck C, Muehler D, Hiller K-A, et al. Limited antimicrobial efficacy of oral care antiseptics in microcosm biofilms and phenotypic adaptation of bacteria upon repeated exposure. *Clin Oral Investig*. 2021;25:2939–50.
5. Klarin B, Adolfsson A, Torstensson A, Larsson A. Can probiotics be an alternative to chlorhexidine for oral care in the mechanically ventilated patient? A multicentre, prospective, randomised controlled open trial. *Crit Care*. 2018;22:272.

R. Dadda-García (RN, MSN, PhD student)^a,
J. de Valles-Fernández (RN)^a,
Á. Solaz-García (RN, MSN, PhD student)^{b,*}

[☆] Please cite this article as: Dadda-García R, de Valles-Fernández J, Solaz-García Á. Higiene bucal con clorhexidina y resistencias bacterianas en los pacientes intubados. *Enferm Intensiva*. 2022;33:52–53.

^a *Hospital Universitario de Cruces, Barakaldo, Bizkaia, Spain*

^b *Grupo de Investigación Perinatología, Instituto de Investigación Sanitaria La Fe, Hospital Universitario y Politécnico La Fe, Valencia, Spain*

* Corresponding author.

E-mail address: alvarosogar@gmail.com (Á. Solaz-García).

<https://doi.org/10.1016/j.enfie.2021.08.001>

2529-9840/ © 2021 Sociedad Española de Enfermería Intensiva y Unidades Coronarias (SEEIUC). Published by Elsevier España, S.L.U. All rights reserved.